CLAIMS

What is claimed is.

1. A method of classifying particles, comprising:

placing a fluid into a device, wherein the fluid contains at least two particle types, and wherein the device includes a first electrode, a second electrode, a third electrode, and a conduit disposed between the second electrode and the third electrode;

first biasing between the second electrode and the third electrode under conditions to focus a first particle type; and

nth biasing between the second electrode and the third electrode under conditions to focus an nth particle type.

2. The method according to claim 1, wherein first biasing under conditions to focus a first particle type includes a first particle type that includes a first plurality of particle types.

3. The method according to claim 1, wherein first biasing under conditions to focus a first particle type includes a first particle type that includes a first plurality of particle types, and following nth biasing, further including:

$n+1^{st}$ biasing between the second electrode and the third electrode under conditions to focus an $n+1^{st}$ particle type.

4. The method according to claim 3, wherein n+1st biasing under conditions to focus a first particle type includes an n+1st particle type that includes an n+1st plurality of particle types.

5. The method according to claim 1, further including:

establishing a convective force in the fluid, wherein the convective force directs the fluid into the conduit.

6. The method according to claim 1, further including:

establishing a convective force in the fluid, wherein the convective force directs the fluid into the conduit, wherein the conditions to focus a particle type include an electrophoretic mobility for a given particle type that overcomes the convective force in the conduit, and wherein the particle type focuses at the second electrode.

7. The method according to claim 1, wherein the first electrode includes a ground, wherein the second electrode includes a varactor, and wherein the third electrode includes a varactor.

8. The method according to claim 1, wherein the fluid is pH-buffered.

9. The method according to claim 1, wherein the at least two particle types include a plurality of zwitterion molecules.

10. The method according to claim 1, after first biasing, further including:

second biasing between the second and third electrodes under conditions to separate a second particle type from the fluid.

11. The method according to claim 1, after at least one of first biasing and Nth biasing, further including:

analyzing at least one of the first particle type and the Nth particle type by a method selected from quantitative analysis, qualitiative analysis, and a combination thereof.

12. The method according to claim 1, wherein the device further includes:

a fluid source reservoir into which is disposed the first electrode;

a fluid receptacle reservoir into which is disposed the third electrode; and

wherein the conduit communicates between the fluid source reservoir and the fluid receptacle reservoir.

13. A device, comprising:

a conduit disposed in a dielectric structure;

a fluid source reservoir disposed at a first end of the conduit;

a fluid receptacle reservoir disposed at a second end of the conduit;

an optional first electrode disposed in the fluid source reservoir and spaced apart from the first end of the conduit;

a second electrode spaced apart from the first electrode and disposed either in the fluid source reservoir proximate the conduit, or in the conduit proximate the fluid source reservoir;

a third electrode disposed in the fluid receptacle reservoir and space apart from the second end of the conduit.

14. The device according to claim 13, further including:

a fluid-moving device connected to the device.

15. The device according to claim 13, wherein the dielectric includes:

a first layer including a channel disposed therein; and

a second layer disposed above the first layer.

16. The device according to claim 13, wherein the conduit includes a liner that resists electroosmosis.

17. The device according to claim 13, wherein the conduit includes a hydroxypropyl methyl cellulose liner.

18. A system for classifying at least two charged particle types comprising:

a device, including:

a conduit disposed in a dielectric structure;

a fluid source reservoir disposed at a first end of the conduit;

a fluid receptacle reservoir disposed at a second end of the conduit;

an optional first electrode disposed in the fluid source reservoir and spaced apart from the first end of the conduit;

a second electrode spaced apart from the first electrode and disposed either in the fluid source reservoir proximate the conduit, or in the conduit proximate the fluid source reservoir;

a third electrode disposed in the fluid receptacle reservoir and space apart from the second end of the conduit;

a fluid containing the at least two charged particle types, wherein the fluid is pH buffered, and wherein the fluid is disposed in the fluid source reservoir;

a blank fluid disposed in the conduit and in the fluid receptacle reservoir; and

a fluid mover for creating a convective force in the conduit.

19. The system according to claim 18, wherein the at least two charged particle types include at least two zwitterions.

20. The system according to claim 18, wherein the at least two charged particle types include at least two mammalian body serum particle types.

21. The system according to claim 18, wherein the dielectric structure is selected from an inorganic dielectric, an organic dielectric, and a semiconductive dielectric.

22. A process of making a particle classifier comprising:

forming a conduit including a first end and a second end in a dielectric structure;

forming a first fluid source reservoir at the first end;

forming a first fluid receptacle reservoir at the second end;

forming an optional first electrode in the first fluid source reservoir and spaced apart from the first end;

forming a second electrode either in the first fluid source reservoir proximate the conduit, or in the conduit proximate the first fluid source reservoir;

forming a third electrode in the first fluid receptacle reservoir and spaced apart from the second end.

23. The process according to claim 22, wherein forming a conduit includes:

etching a channel in a first substrate;

covering the first substrate with a second substrate; and

optionally treating the channel with a neutralizing process.

24. The process according to claim 22, wherein forming a conduit includes:

etching a channel in a first substrate;

covering the first substrate with a second substrate; and

optionally treating the channel with a neutralizing process; and further including:

etching the first fluid source reservoir and the first fluid receptacle reservoir through second substrate;

forming the second electrode by deposition in the first fluid source reservoir and upon the second substrate; and

optionally forming the third electrode by deposition in the first fluid receptacle reservoir and upon the second substrate.

25. The process according to claim 22, further including:

forming a second fluid source reservoir;

forming a second fluid receptacle reservoir;

forming a fourth electrode in the second fluid source reservoir; and

forming a fifth electrode in the second fluid receptacle reservoir.